International Journal of Biomedical Research
ISSN: 0976-9633 (Online); 2455-0566 (Print)
Journal DOI: https://doi.org/10.7439/ijbr
CODEN: IJBRFA

Case Report

Metastatic retroperitoneal testicular germ cell tumor: A case report

Shikha Sharma, Sarita Asotra*, Manish Gupta, Lekshmi Vijayamohanan and Ankita Sharma

Indira Gandhi Medical College & Hospital, Ridge Sanjauli Rd, Lakkar Bazar, Shimla, Himachal Pradesh 171001, India

Abstract

Germ cell tumors can be malignant or nonmalignant (benign) tumors that originate from germ cells. They are much more common in ovaries than in testis. Metastasis of germ cell tumors is relatively rare. We present the case of a young adult male who was initially diagnosed with malignant mixed germ cell tumor and later developed a metastatic retroperitoneal mass in a time frame of approximately one year.

Keywords: Teratoma, Metastasis, retroperitoneum, germ cell tumors, testis.

***Correspondence Info:**
Dr. Sarita Asotra
Indira Gandhi Medical College & Hospital,
Ridge Sanjauli Rd, Lakkar Bazar,
Shimla, Himachal Pradesh 171001, India

***Article History:**
Received: 02/07/2020
Revised: 25/07/2020
Accepted: 28/07/2020
DOI: https://doi.org/10.7439/ijbr.v11i7.5457

QR Code

How to cite: Sharma S, Asotra S, Gupta M, Vijayamohanan L and Sharma A. Metastatic retroperitoneal testicular germ cell tumor: A case report. *International Journal of Biomedical Research* 2020; 11(07): e5457. DOI: 10.7439/ijbr.v11i7.5457 Available from: https://ssjournals.com/index.php/ijbr/article/view/5457

1. Introduction

Testicular tumors make up approximately 1% of all the cancers in men [1,2]; however, testicular cancer remains to be the most common solid organ malignancy in young males, with peak incidence ranging from age 25–29 years [3]. An overwhelming bulk of primary testicular tumors originates from germ cells [4], which are histologically divided into seminomas or non-seminomatous (NSGCT) types. NSGCs are further seen to occur in various combinations: 1) embryonal carcinoma with or without seminoma, occurring in about 25% of the group; 2) teratoma with or without seminoma, which occurs in about 7% of the group; 3) teratocarcinoma including teratoma with embryonal carcinoma, choriocarcinoma, or both with or without seminoma occurring in about 25% of the group; 4) choriocarcinoma with or without seminoma or embryonal carcinoma or both accounting for the remaining 1-3%. Teratoma is a subtype of non-seminomatous germ cell tumors (NSGCT) derived from more than one of the three germinal layers. These are classified as mature tumors (cystic or solid), comprising well-differentiated tissues, or as immature tumors, which contain poorly differentiated tissues consisting primarily of embryonic-appearing neuroglial or neuroepithelial components [5,6]. Sacrococcygeal region (57 %) and the gonads (29 %) are the most commonly involved sites of teratomas; they are much more common in the ovaries; however, they also arise in the testes. Retroperitoneal teratomas in adults are rare and represent only 1–11% of all primary teratomas [7]. Growing teratoma syndrome (GTS) is a term used for metastatic masses during or after chemotherapy for germ cell tumors, containing the components of mature teratoma only. The peritoneum of the pelvis and abdomen and the retroperitoneum are the most frequent sites of metastasis [8].

2. Case report:

A 24 year old male patient presented to the Surgical Outpatient Department of IGMC Shimla in December 2019 with complain of abdominal pain and swelling and no other medical comorbidity. One year before in 2018, the patient underwent right high inguinal orchidectomy and was diagnosed with malignant mixed germ cell tumor with histopathology revealing immature teratoma, yolk sac tumor and embryonal carcinoma with invasion into the tunica albugina and epididymis. Since then, the patient had completed three cycles of BEP.

On physical examination (P/A), multiple discrete, hard and nodular masses were palpated in the umbilical and lumbar region, with largest measuring approximately 5*4 cms.

CECT abdomen showed evidence of a large heterogeneously enhancing retroperitoneal soft tissue mass measuring approximately 15.6*12.2*13.8 extending from left hypochondrium to the left lumbar region causing external contour bulge. It was crossing the midline and extending up to the right hypochondrium and lumbar region. The mass caused the lateral displacement of the left kidney and gut loops and anterior displacement of abdominal aorta and pancreas.

Tumor markers AFP and B-hCG levels were within normal limits.

A biopsy tissue comprising multiple bits of grey-brown to grey white soft tissue pieces was received in the pathology department. Histopathological examination revealed multiple tissue fragments showing the benign gastrointestinal, respiratory type of epithelium, mature neural tissue, benign cartilage, smooth muscle, fibrous tissue adipose tissue and sheets of immature neuroectodermal tissue and a diagnosis of metastatic germ cell tumor of teratoma component was given.

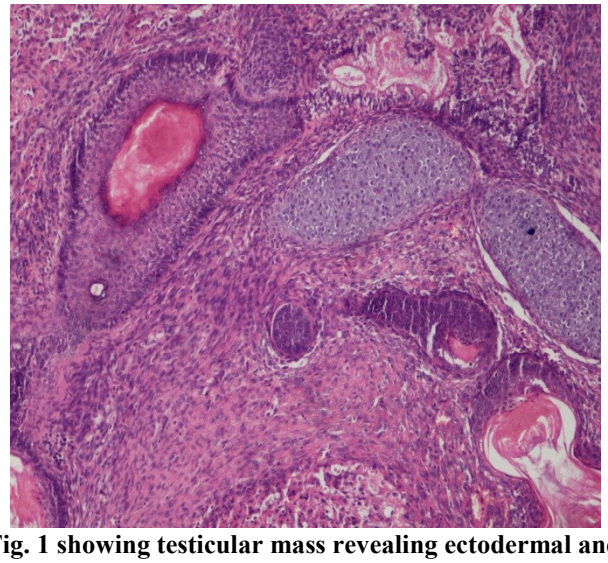

Fig. 1 showing testicular mass revealing ectodermal and mesenchymal components of teratoma

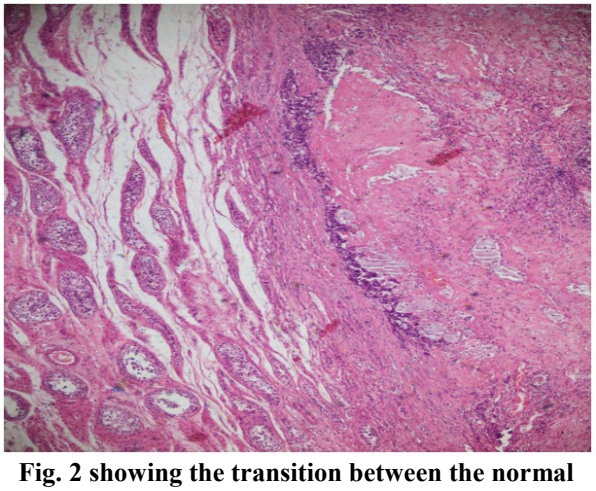

Fig. 2 showing the transition between the normal seminiferous tubules and the testicular tumor

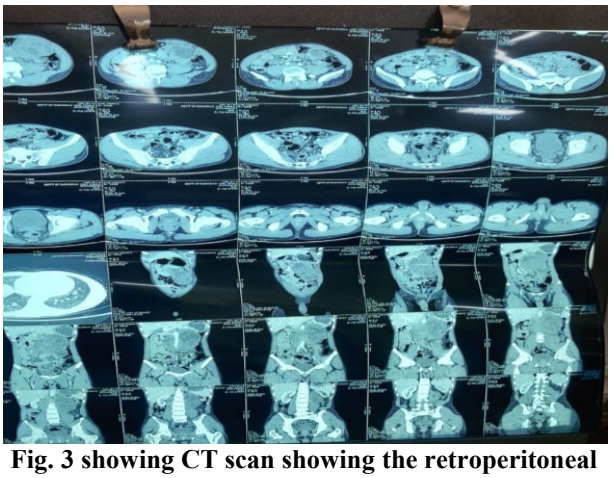

Fig. 3 showing CT scan showing the retroperitoneal mass

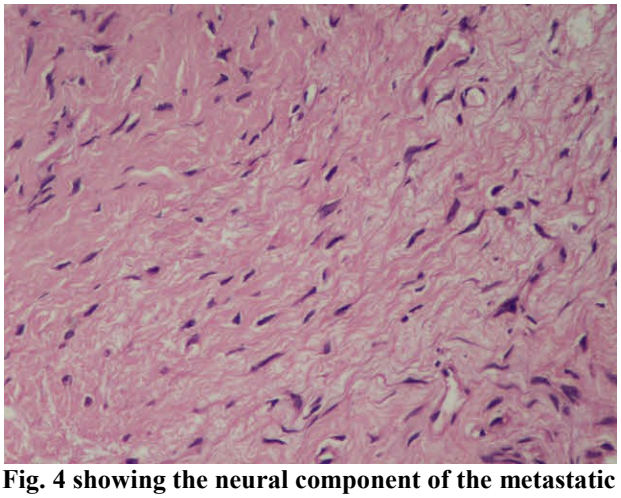

Fig. 4 showing the neural component of the metastatic teratoma

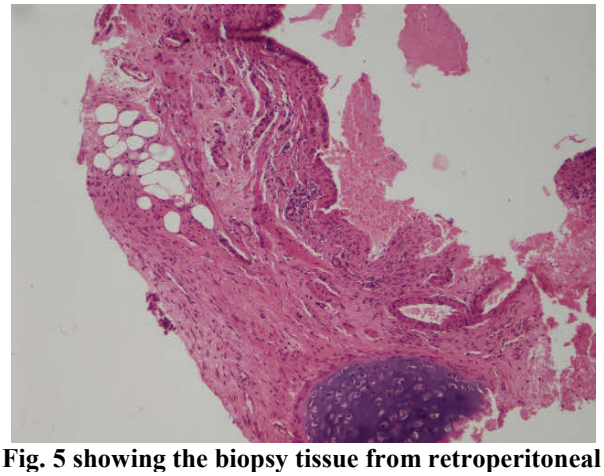

Fig. 5 showing the biopsy tissue from retroperitoneal mass revealing respiratory epithelium, cartilage, adipose tissue, fibrocollagenous tissue and blood vessels

3. Discussion

Testicular cancer is the most common cancer among male, which occurs between 15-44 years[13]. In the present case, the patient was 24 years old. In general, testicular cancer accounts for about 1% of men's cancers around the world [9]. Among risk factors for testicular cancer, most important ones are viruses, hormonal factors,

chemicals, age, geographical distribution, race, socioeconomic factors, education, smoking, nutrition, physical activity, occupation, and immigration [10]. Testicular tumors are classified into two broad terms - germ cell tumors and non-germ cell tumors. A large majority, approximately 95 % of testicular tumors are seen to arise from germ cells. Germ cell tumors are further divided into seminomas and non-seminomatous tumors (NSGCT). Seminomas occur in approximately 40% of the population, and non-seminomatous tumors (NSGCT) may be seen in the pure or mixed form [11,12]. NSGCTs are histopathologically heterogenous and commonly consists of embryonal carcinoma, yolk sac tumor, teratoma and choriocarcinoma. Teratomatous elements are found in 55-85 % of all NSGCTs in adults [12-14]. Teratoma is a tumor containing tissue elements derived from different germ cell layers (endoderm, mesoderm, and ectoderm). Because teratomas arise from pluri-potent embryonic cells, they have variable recognizable somatic tissues. Teratomas are typically classified into three general categories: mature (cystic/solid and benign), immature (malignant), or mondermal (highly specialized) [15]. Each of these histological types may present alone or in combination with others. A mature teratoma consists of an adult-type tumour with well-differentiated elements.

In contrast, an immature teratoma consists of elements with only partial somatic differentiation, resembling those seen in embryonic or foetal tissues [16]. Teratomas are also classified using the Gonzalez-Crussi grading system: 0 or mature (benign); 1 or immature, probably benign; 2 or immature, possibly malignant (cancerous); and three or frankly malignant [17]. Teratomas are considered foreign to any anatomical region in which they are found despite their tendency to differentiate into somatic tissue types[7]. Teratomas are usually located in the ovaries, followed by the testis, anterior mediastinum or in the retroperitoneum. Retroperitoneally the teratomas often present near the upper pole of the kidney with a predominance towards the left side [18]. Retroperitoneal teratomas are clinically present as abdominal distension and mass effect (pain, nausea, and vomiting) via compression of surrounding structures [19]. The patient in the present case also presented with abdominal distention and mass effect. The diagnosis of retroperitoneal teratoma cannot be made entirely on clinical details. Radiologic interventions like ultrasound and CT scan are extremely valuable and may show the presence of tumor components like bone, calcification, teeth or fat. Prognosis is dependent on complete resection of the resection margins and is excellent for benign teratomas. Torsion is common in these tumours, and if by any chance rupture occurs, sebaceous material can spill out into the abdominal cavity, resulting in shock, haemorrhage, or a marked granulomatous reaction resulting in the formation of adhesions [15]. Resection of benign tumours results in an almost 100% five-year survival rate. In long-term studies, the best survival rates for primary retroperitoneal tumours and disease-free survival is associated with complete surgical resection [20].

4. Conclusion

Metastatic retroperitoneal teratomas are rare lesions. They are usually asymptomatic, although they may be diagnosed preoperatively by imaging with CT and MRI. Surgical resection remains the mainstay of treatment for mature retroperitoneal teratomas, and if the margins are oncologically clear, it yields a near 100% 5-year survival. Thus, it is empirical to follow up on the cases of malignant germ cell tumors as they have a great tendency to metastasize.

References

[1]. Jemal, A., R. Siegel, and E. Ward. *et al*. Cancer statistics, 2006. *CA Cancer J Clin* 2006. 56:106–130.

[2]. Krain, L. S. Testicular cancer in California from 1942 to 1969: the California Tumor Registry experience. *Oncology* 1973. 27:45–51.

[3]. Stevenson SM, Lowrance WT. Epidemiology and diagnosis of testis cancer. *Urologic Clinics*. 2015 Aug 1;42(3):269-75.

[4]. Talerman, A. Germ cell tumours. *Ann Pathol,* 1985; 5:145–157.

[5]. Helman LJ, Malkin D. Cancers of the Childhood. In: DeVita, Hellman, and Rosenberg, editors. Cancer: Principles and Practice of Oncology, Philadelphia: Lippincott Williams & Wilkins; 2011.

[6]. Isaacs H. Germ cell tumors. In: Tumors of the fetus and infant: an atlas. Germany: Springer; 2013: 5–29.

[7]. Alghamdi HM. Metastatic testicular retroperitoneal teratoma in an adult: Case report. *Int J Surg Case Rep*. 2019; 60:133-136. DOI:10.1016/j.ijscr.2019.06.004

[8]. Shibata K, Kajiyama H, Kikkawa F: Growing Teratoma Syndrome of the Ovary Showing Three Patterns of Metastasis: A Case Report. *Case Rep Oncol* 2013; 6:544-549. DOI: 10.1159/000356563

[9]. Filippou P, Ferguson JE, 3rd, Nielsen ME. Epidemiology of prostate and testicular cancer. *Semin Intervent Radiol* 2016; 33: 182-185.

[10]. Farmanfarma KK, Mahdavifar N, Mohammadian-Hafshejani A, Salehiniya H. Testicular cancer in the world: an epidemiological review. *J Canc Res.* 2018 Jan 1;5(4):1-5.

[11]. Carver BS, Al-Ahmadie, Sheinfeld J. Adult and Pediatric testicular teratoma. *Urol Clin North Am* 2007; 34:245-51.

[12]. Johnson V, Osunkoya A, Delman Keith, Baumgarten A, Master Viraj. Novel case of metastatic testicular immature teratoma invading the duodenum. *Open Surg Oncol Journal* 2009; 1:16-18.

[13]. Leibovitch I, Foster, RS, Ulbright TM *et al*. Adult primary pure teratoma of the testis. The Indiana experience. *Cancer* 1995; 75: 2244–50.

[14]. Porcaro AB, Antoniolli SZ, Martignoni G, Brunelli M, Curti P. Adult primary teratoma of the testis-report on 5 cases in clinical stage I disease. *Int Urol Nephrol* 2001; 33 (4); 657-59.

[15]. Gershenson D. Ovarian germ cell tumors: pathology, clinical manifestations, and diagnosis. In: Goff B., Pappo A.S., editors. UpToDate Patient Preview. UpToDate; Waltham, Mass, USA: 2009.

[16]. Liu H., Wanmeng L., Wenlong Y., Youfei Q. Giant retroperitoneal teratoma in an adult. *Am. J. Surg.* 2007; 193(6):736–737.

[17]. Gonzalez-Crussi, F (1982) Extragonadal Teratomas. Atlas of Tumor Pathology, Second Series, Fascicle 18. Armed Forces Institute of Pathology, Washington D.C.

[18]. Retroperitoneal teratoma in an adult presenting with painful abdominal mass: case history and literature review. *BJMP* 2012;5(1):a509

[19]. Taori K., Rathod J., Deshmukh A. Primary extragonadal retroperitoneal teratoma in an adult. *Br. J. Radiol.* 2006; 79(946):120–122.

[20]. Omranipour R., Alavion M. Cervical mature teratoma 17 years after initial treatment of testicular teratocarcinoma: report of a late relapse. *World J. Surg. Oncol.* 2007; 5(1).